AMENDMENTS TO THE CLAIMS

This listing of the claims shall replace all prior versions and listing of the claims in this application:

1. (Currently amended) A method of recovery from a data storage system failure in a data storage system having a host computer writing updates to a local storage controller associated with a local storage device at a local site, the local storage controller asynchronously copying the updates to a remote storage controller at a remote site, the remote storage controller storing the updates on a remote storage device and periodically storing a consistent point in time copy of the updates on a backup storage device, the method comprising:

detecting a failure associated with the local site;

terminating copying the updates from the local storage controller to the remote storage controller;

establishing a reverse asynchronous copy relationship from the remote storage controller to the local storage controller;

determining whether ~~a consistent point in time copy of the updates pending for storage~~ an intact consistency group exists on the backup storage device at the time the failure is detected ~~form an intact consistency group~~;

forming a new intact consistency group if an intact consistency group does not exist on the backup storage device at the time the failure is detected;

removing inconsistent data from the remote storage device by performing a reverse point in time copy operation from the backup storage device to the remote storage device;

recording post-failure updates processed by the remote storage controller;

correcting the failure associated with the local site; and

copying changed data from the remote storage device to the local storage device to resynchronize the local storage device with the remote storage device.

2. (Original) The method of claim 1 further comprising the following steps upon detecting the failure associated with the local site:

terminating the asynchronous copying of updates from the local storage controller to the remote storage controller;

establishing a reverse asynchronous update copying relationship from the remote storage controller to the local storage controller; and

quiescing the host computer.

3. (Currently amended) The method of claim 1 further comprising taking corrective action on the updates pending for storage on the backup device to create an intact consistency group, wherein the corrective action taken is selected from a group of actions comprising issuing a FlashCopy commit command to complete and harden a new consistency group and issuing a Flashcopy revert command to roll back to a prior consistency group.

4. (Cancelled)

5. (Currently amended) The method of claim ~~4~~ 1 further comprising physically copying to the backup storage device the updates in the intact consistency group, thereby forming a recovery consistency group and tracking changes involved in forming the recovery consistency group.

6. (Cancelled)

7. (Currently amended) The method of claim ~~6~~ 1 further comprising writing post-failure updates directly to the remote storage controller and tracking the post-failure updates in preparation for resynchronization to the local storage device.

8. (Original) The method of claim 7 wherein the post-failure updates are written to the remote storage controller from a remote host.

9. (Currently amended) The method of claim ~~7~~ 1 wherein re-synchronizing the local storage device comprises synchronizing the local storage device with the recovery consistency group and the post-failure updates by the asynchronous copying of updates from the recovery storage controller to the local recovery controller.

10. (Currently amended) The method of claim 7 further comprising the following steps after the local storage device is re-synchronized:

~~quiescing the recovery host;~~

terminating the asynchronous copying of updates from the remote storage controller to the local storage controller;

re-establishing the asynchronous copy relationship from the local storage controller to the remote storage controller; and

storing a new consistent copy of the data on the remote storage device to the backup storage device.

11. (Cancelled)

12. (Currently amended) A system for copying stored data and having the ability to recover from a failure comprising:

means for detecting a failure associated with a local storage site having a local storage controller and a local storage device;

means for copying changed data from a remote storage device to the local storage device to resynchronize the local storage device with the remote storage device after the failure is corrected; and

a remote storage controller having:

means for asynchronously receiving updates from the local storage controller;

means for writing the updates to a remote storage device;

means for storing a consistent point in time copy of the updates on a backup storage device;

means for terminating copying the updates from the local storage controller to the remote storage controller;

means for establishing a reverse asynchronous copy relationship from the remote storage controller to the local storage controller;

means for determining whether ~~a group of pending updates for storage on the backup storage device form~~ an intact consistency group an intact consistency group exists, upon detection of the failure associated with the local site forming a new intact consistency group if an intact consistency group does not exist on the backup storage device at the time the failure is detected;

means for removing inconsistent data from the remote storage device;

means for recording post-failure updates processed by the remote storage controller;

means for performing a reverse point in time copy operation from the backup storage device to the remote storage device by performing a reverse point in time copy operation from the backup storage device to the remote storage device; and

means for copying changed data from the remote storage device to the local storage device to resynchronize the local storage device with the remote storage device.

13. (Currently amended) The system for copying stored data of claim 12 wherein the remote storage controller further comprises means for taking corrective action on the group of pending updates to create an intact consistency group, wherein the corrective action taken is selected from a group of actions comprising issuing a FlashCopy commit command to complete and harden a new consistency group and issuing a Flashcopy revert command to roll back to a prior consistency group.

14. (Cancelled)

15. (Currently amended) The system for copying stored data of claim ~~14~~ 12 further comprising a recovery consistency group physically stored on the backup storage

device, formed from the intact consistency group whereby changes involved in forming the recovery consistency group are tracked.

16. (Original) The system for copying stored data of claim 15 further comprising a remote host.

17. (Currently amended) The system for copying stored data of claim 16 wherein the remote storage controller receives post-failure data updates directly from the remote host.

18. (Currently amended) The system for copying stored data of claim 17 wherein the means for re-synchronizing the local storage device after the failure is corrected comprises ~~the asynchronous~~ means for asynchronously copying of post-failure updates and updates in the recovery consistency group from the remote storage controller to the local storage controller.

19. (Original) The system for copying stored data of claim 17 wherein the remote storage controller further comprises means for merging post-failure updates written to the remote storage device with the recovery consistency group on the backup storage device, creating a new consistency group.

20. (Currently amended) An article of manufacture for use in programming a data storage system to recover from a failure, the data storage system having a host computer writing updates to a local storage controller associated with a local storage device, at a local site having a local storage device, the local storage controller asynchronously copying the updates to a remote storage controller at a remote site, the remote storage controller storing the updates on a remote storage device and periodically storing a consistent point in time copy of the updates on a backup storage device, the article of manufacture comprising a storage medium having logic embedded therein to cause components of the data storage system to:

detect a failure associated with the local site;

terminate copying the updates from the local storage controller to the remote storage controller;

establish a reverse asynchronous copy relationship from the remote storage controller to the local storage controller;

determine whether ~~a consistent point in time copy of the updates pending for storage~~ an intact consistency group exists on the backup storage device at the time the failure is detected ~~form an intact consistency group~~;

form a new intact consistency group if an intact consistency group does not exist on the backup storage device at the time the failure is detected;

removing inconsistent data from the remote storage device by performing a reverse point in time copy operation from the backup storage device to the remote storage device;

recording post-failure updates processed by the remote storage controller;

correct the failure associated with the local site; and

copy~~ing~~ changed data from the remote storage device to the local storage device to resynchronize the local storage device with the remote storage device.

21. (Original) The article of manufacture of claim 20 wherein the logic further causes components of the data storage system to take the following steps upon detecting the failure associated with the local site:

terminate the asynchronous copying of updates from the local storage controller to the remote storage controller;

establish a reverse asynchronous update copying relationship from the remote storage controller to the local storage controller; and

quiesce the host computer.

22. (Currently amended) The article of manufacture of claim 20 wherein the logic further causes components of the data storage system to take corrective action on the updates pending for storage on the backup storage device to create an intact consistency group, wherein the corrective action taken is selected from a group of actions comprising issuing a FlashCopy commit command to complete and harden a

new consistency group and issuing a Flashcopy revert command to roll back to a prior consistency group.

23. (Cancelled)

24. (Currently amended) The article of manufacture of claim ~~23~~ 20 wherein the logic further causes components of the data storage system to physically copy to the backup storage device the updates in the intact consistency group, thereby forming a recovery consistency group and track changes involved in forming the recovery consistency group.

25. (Cancelled)

26. (Currently amended) The article of manufacture of claim ~~25~~ 20 wherein the logic further causes components of the data storage system to write post-failure updates directly to the remote storage controller and track the post-failure updates in preparation for resynchronization to the local storage device.

27. (Original) The article of manufacture of claim 26 wherein the logic further causes components of the data storage system to write the post-failure updates to the remote storage controller from a remote host.

28. (Currently amended) The article of manufacture of claim ~~26~~ 20 wherein the logic further causes components of the data storage system to re-synchronize the local storage device by synchronizing the local storage device with the recovery consistency group and the post-failure updates through the asynchronous copying of the updates from the recovery storage controller to the local recovery controller.

29. (Currently amended) The article of manufacture of claim 26 wherein the logic further causes components of the data storage system to take the following steps after the local storage device is re-synchronized:

~~quiesce the recovery host;~~

terminate the asynchronous copying of updates from the remote storage controller to the local storage controller;

re-establish the asynchronous copy relationship from the local storage controller to the remote storage controller; and

store a new consistent copy of the data on the remote storage device to the backup storage device.

30. (Cancelled)